VS-507

Voltage Controlled SAW Oscillator

Description

The VS-507 VCSO (Voltage Controlled Saw Oscillator) from Vectron is an ultra high frequency, ultra low phase noise oscillator. The VS-507 provides 10fs rms jitter in a 12kHz to 20MHz integration bandwidth and is available from 3 to 6 GHz.

Features

- Frequency Range 3.0 to 6.0 GHz
- Ultra low jitter performance
- Typical Jitter: 10fsec rms, 12kHz to 20MHz
- 3.3 supply voltage
- Output: Sinewave & Balanced Sinewave
- 9x14 mm SMD package
- See table on Page 5 for standard frequencies

Applications

- High Speed ADCs
- 100G & 400G Coherent Receivers
- 5G BTS
- Test & Measurement
- Military

Performance Specifications

Pulling Characteristics					
Parameter	Min	Typ	Max	Units	Notes
Absolute Pull Range (APR)	±5			ppm	Includes df vs: •Operating temperature range -40 .. 85°C •Aging 10 years •Supply Voltage Change 5% •Load change 10%
Tuning Slope					Positive
Control Voltage Range	0	1.65	3.3	V DC	with V_S = 3.3V
Frequency control input impedance	100			kΩ	
Modulation bandwidth	20			kHz	@ -3dB
Supply Voltage (Vs)					
Supply voltage (standard)	3.135	3.3	3.465	V DC	
Current consumption			85	mA	

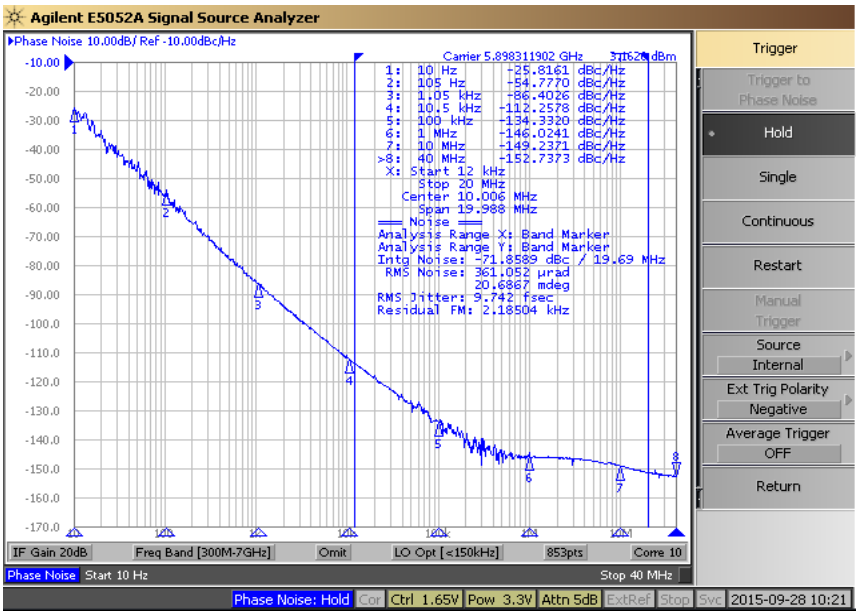
RF Output					
Parameter	Min	Typ	Max	Units	Notes
Signal		Sinewave			
Load	45	50	55	Ω	
Output Power	0	3	6	dBm	
Signal		Balanced Sinewave			
Load	45	50	55	Ω	
Output Power	0	3	6	dBm	
Phase Noise: 100Hz offset		-54		dBc/Hz	@ 5.89824GHz Sinewave 3.3V
Phase Noise: 1kHz offset		-86		dBc/Hz	
Phase Noise: 10kHz offset		-112		dBc/Hz	
Phase Noise: 100kHz offset		-134		dBc/Hz	
Phase Noise: 1MHz offset		-146		dBc/Hz	
Phase Noise: 10MHz offset		-149		dBc/Hz	
Jitter: 12kHz to 20MHz offset		10		fs rms	

Additional Parameters					
Parameter	Min		Max	Units	Notes
Weight		2.0g			
Subharmonics			-25	dBc	
Processing and Packing		Handling and Processing Note			
Absolute Maximum Ratings					
Parameter	Min		Max	Units	Notes
Supply Voltage (V_S)			6.0	V	
Operable Temperature Range	-40		+85	ºC	
Storage Temperature Range	-40		+95	ºC	

Typical Performance

Phase Noise

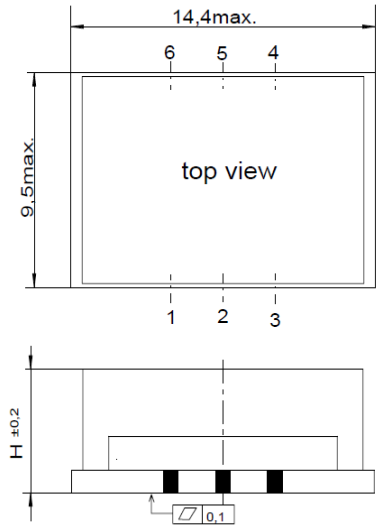
VS-507 @ 5.89824GHz Sinewave



Outline Drawing / Enclosure

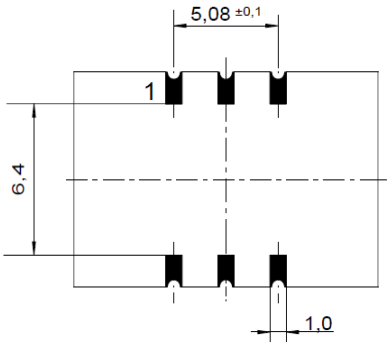
Package Codes		
Code	Height "H"	Pin Length "L"
G218C	2.8	N/A
G218E	4.7	N/A

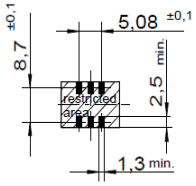
Dimensions in mm



G 218

H = 5,9 ; G218 B
H = 2,8 ; G218 C
H = 2,6 ; G218 D
H = 4,7 ; G218 E
H = 5,7 ; G218 F
H = 5,4 ; G218 G
H = 4,9 ; G218 H





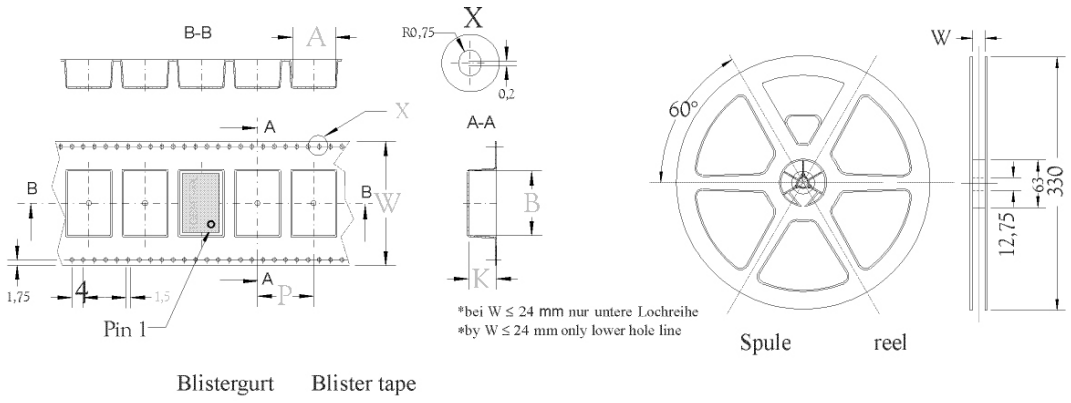
Padvorschlag
land pattern
recommendation

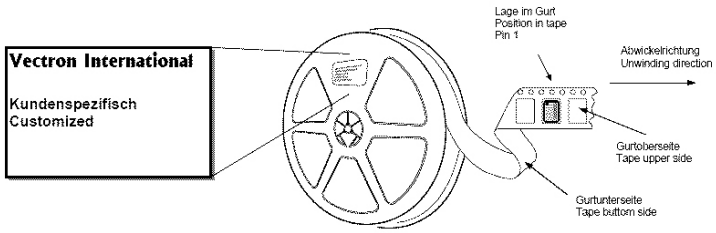
Pin Assignment Sinewave	
1	Control Voltage (V_C)
2	GND
3	GND
4	RF Out
5	N.C.
6	Supply Voltage Input (V_S)

Pin Assignment Balanced Sinewave	
1	Control Voltage (V_C)
2	GND
3	GND
4	RF Out
5	RF-Out Compl. (180° phase shifted)
6	Supply Voltage Input (V_S)

Marking
VS-507-xxxx
Frequency
•AYYWW

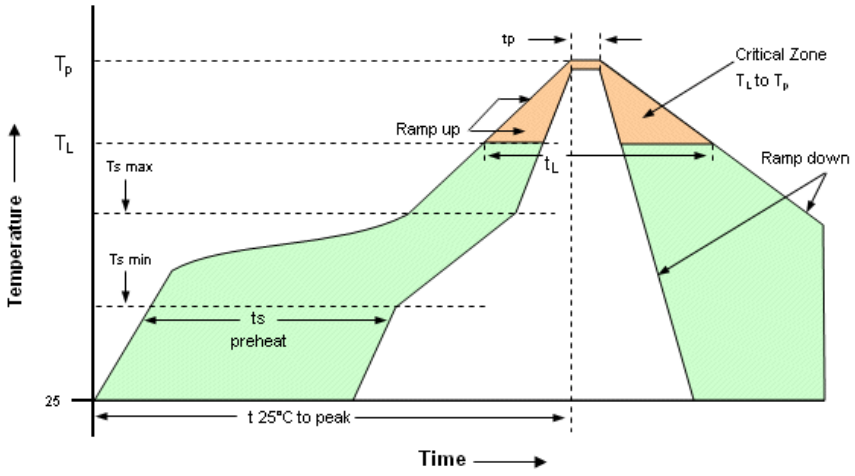
Standard Shipping Method





Enclosure Type	Tape Width W (mm)	Quantity per meter	Quantity per reel	Dimension P (mm)
G218C	24		1700	12
G218E	24		850	12

Recommended Reflow Profile



Profile Feature	Pb-Free Assembly/Sn-Pb Assembly	Profile Feature	Pb-Free Assembly/Sn-Pb Assembly
Average ramp-up rate (T_L to T_p)	3°C/second max.	Time 25°C to Peak Temperature	8 minutes max.
Preheat - Temperature Min T_{Smin} -Temperature Min T_{Sma} -Time (min to max) t_S	150°C 200°C 60-180 seconds	Time maintained above -Temperature (T_L) -Time (t_L)	217°C 60-150 seconds
T_{Smax} to T_L -Ramp-up Rate	3°C/second max		
Time maintained above -Temperature (T_L) -Time (t_L)	217°C 60-150 seconds	Time within 5°C of actual Peak-Temperature (t_p)	20-40 seconds
Peak Temperature (T_p)	max 260°C	Ramp-down Rate	6°C/ second max

Note: All temperatures refer to topside of the package, measured on the package body surface.
SMD oscillators must be on the top side of the PCB during the reflow process.

Ordering Information

VS - 507 1 - E E E - 506 X - 5898M24

- **Product Family**
  VS: VCSO
- **Package**
  9x14mm SMT
- **Height**
  0: 2.8mm (G218C)
  1: 4.7mm (G218E)
- **Supply Voltage**
  E: +3.3V
- **RF Output Code**
  E: Sinewave
  F: Balanced Sinewave
- **Temperature Range**
  E: -40°C to +85°C
- **APR Code**
  506: ±5ppm
- **Enable**
  X: No Enable
- **Frequency**

Standard Frequencies (MHz)						
3137.95842	3328	3468.75	3494.061674	3799.904088	3922.418236	3973.638766
4000	4096.9586	4137.350272	4160	4270.747196	4800	4915.2
5120	5898.24					

Other frequencies and temperature ranges available upon request

Notes:

1. Contact factory for improved stabilities or additional product options. Not all options and codes are available at all frequencies.
2. Unless other stated all values are valid after warm-up time and refer to typical conditions for supply voltage, frequency control voltage, load, temperature (25°C).
3. Phase noise degrades with increasing output frequency.
4. Subject to technical modification.
5. Contact factory for availability.

For Additional Information, Please Contact

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